

SWPEF-1

29 October 1954

MEMORANDUM THRU: CHIEF, WEAPONS EFFECTS DIVISION

FOR: DEPUTY CHIEF OF STAFF, TECHNICAL SERVICES

SUBJECT: Final Rad-Safe Report, Operation CASTLE

1. This final report, consisting of two thick volumes, is broken primarily into five parts as described on page 1, paragraph 1, Volume I. (References are tabbed with paper clips.) It covers the overall CASTLE radiological safety program of direct concern to Headquarters, Joint Task Force SEVEN. The purpose of the report, in addition to documenting the rad-safe problems at CASTLE, is to assist in the development of future radiological safety plans by discussions of the problems and solutions that arose during this operation.

2. The basic maximum permissible exposure (MPE) was the integrated exposure of 0.3r/week over thirteen weeks resulting in 3.9r total except in the case of personnel remaining longer than the basic thirteen weeks. Members of air sampling aircraft were authorized a total MPE of 20r for the operation. The Task Force Commander was authorized to revise the 3.9r MPE when circumstances indicated the need and justification therefor. (Pages 25 and 26) Except for relatively high accidental exposure in the case of 28 personnel in the Task Force Weather Station on Rongerik Atoll and a few other cases, none of the Task Force personnel received more than 7.8r and only 8% received more than 3.9r. (Pages 6 and 7) Eighty-two natives of Rongelap Atoll and 154 natives of Uterik were evacuated to Kwajalein as the result of fall-out from the Bravo Shot. Some of the Rongelap natives received more than 100r and the Uterik natives, approximately 17r. No significant after effects resulted from these exposures. (Pages 8 and 9)

3. The much publicized Japanese fishing vessel was in an area 80 to 90 miles East Northeast of Bikini (according to the Japanese). This vessel was not in the expected direction of fall-out and was not noticed during the pre-shot warning surveys. After the shot, when the fall-out direction became apparent, planes were sent in this specific direction to warn ships that might have been missed earlier, but this vessel was not warned due to severe aerial contamination of both the original search aircraft and a replacement search aircraft. (Page 9)

4. The IVY Mike early crosswind and upwind intensity lines were plotted as an overlay on Bikini Atoll as an approximation to the close-in contamination that could be expected from high yield land surface shots, with allowances for differences in yields and shot conditions. In addition, a new technique to define close-in fall-out was developed by

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Dr. Thomas White, Los Alamos Scientific Laboratory, and is being further refined for future tests. (Page 55 and Tab D, Incl 3) It was found that generally speaking, wind conditions acceptable at Bikini Atoll were also acceptable at Eniwetok, but that the converse is not always true. (Page 62)

5. Though not too specific on this point, the report seems to indicate that the failure to prognosticate properly the fall-out areas was due in large part to the lack of precise weather forecasting, specifically as regards the winds aloft. (Pages 29, 69 and 70) Specific recommendations as to needed improvements in the solution of fall-out problems are given on page 70.

6. The significant fall-out area from the large yield shots (infinity dose greater than 50r) was a zone in the order of 100 miles wide and 300 miles long. (Page 87)

7. Specific recommendations based on the experience during this operation are given on pages 101-106. These recommendations are presented in seven groups entitled general, weather, fall-out forecasting, dosimetry, rad-safe survey, personnel, and communications.



E. C. LaVIER
LtCol, USAF
Chief, Radiation Branch

AFSWP ROUTING AND CONTROL SHEET

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| | DEPUTY CHIEF, USN | | | | CONCURRENCE | FILE NUMBER | SUSPENSE DATE |
| 4 | CHIEF STAFF | | | | INFORMATION | SWPWT 970.5 | |
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| | CHIEF, PLANS AND COMTS | | | | NOTE AND FORWARD | Wpns Test | 29 Oct 54 |
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| 3 | DCS/TECHNICAL SERVICES | 327 | 10/1 | | | | |
| | CHIEF, WPNS DEV | | | Memo - Final Rad Safe Report, Operation CASTLE | | | |
| 2 | CHIEF, WPNS EFFECTS-1 | OK | 1 Nov 54 | | | | |
| 1 | CHIEF, WPNS TEST | PK7 | 10/29 | TYPE OF COMMUNICATION; NUMBER OF COPIES, INCLOSURES AND INDORSEMENTS | | | |
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| 2A | Reduction in | EL | 11/1 | | | | |

REMARKS

Cys 1 & 2A - Addressee
Cys 3 & 4A - WT Files (w/1 in WT)

Copy of this should be passed to C/S CJTF 7 for his info.

W2 Destroyed

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Date: 1/19/94

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29 October 1954

SWPWT

MEMORANDUM THRU: Chief, Weapons Effects Division

FOR: Deputy Chief of Staff, Technical Services

SUBJECT: Final Rad Safe Report, Operation CASTLE

1. With regard to the comments already drafted, I offer the following:

a. Para. (5) - The "report" is not too specific on assigning "failure to prognosticate properly the fallout areas was due in large part to the lack of precise weather forecasting specifically as regards winds aloft." The reason for lack of specific indication is the report cannot state boldly some operational considerations which cannot be admitted - i.e. the command personnel knew that the weather situation was a deteriorating one. The decision was shaved too closely - note History of Operation CASTLE, Vol. I Chart Page 176 - BRAVO time line. To say that the forecast of wind directions at critical lower levels changed about 10 degrees toward the inhabited islands after shot time is no revelation of poor forecasting. The state of the art of forecasting does not permit such refinement. Ten degrees plus or minus for a forecast of wind levels all the way from the surface to 70,000 feet is actually within the error of measurement itself or the wind parameter. Had BRAVO been fired on D-2 or D-1 upper wind patterns which were known to be favorable, the native exposure episode would never have happened. Decisions on whether to shoot or not were shaved at GREENHOUSE - ITEM, and the result was an exposure incident - but you can't find it in the reports. The weather forecasting for the degree required prior to BRAVO was better than good - and when thinking of wind one should think of direction and velocity - had the velocity of wind between 15-55000 feet been 15 to 20 knots less the problem again at the native inhabited islands would have been much less of an emergency nature.

2. Although much is said of new dynamic fall out forecasting techniques, the fact still remains that the degree of precision in fall out forecasting required from the weather forecasting input must be compatible. Tremendous expenditures of effort - obtaining more synoptic weather data-could be recommended but the answer to avoiding BRAVO episodes is in not shooting under marginal conditions. There are firm wind patterns favorable for even larger yields than CASTLE series, but man must wait for them - they are random in occurrence - we saw them about twice a month at PPG area - but if they are to be

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utilized, JTF must be ready for them on short notice, i.e. 2 atoll capability and flexibility in "go" or "no go" decisions at either atoll.

3. Testing of Megaton range devices requires much radial space around the PPG. If 50-100 mr/hr at 500 miles plus from GZ for say 8 or 9 hours duration is considered a real problem, then future testing at PPG is rough business.

4. I consider the CASTLE radsafe report the most comprehensive to date from an operational standpoint.



R. H. Maynard
Capt, USN
Weapons Test Division


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| DEPUTY CHIEF, USA | P | 11/14 | COMMENT | | WT-1486 |
| 4 DEPUTY CHIEF, USN | | | CONCURRENCE | FILE NUMBER | EF-3896 |
| 3 CHIEF STAFF | | | INFORMATION | SWPEF-1 | SUSPENSE DATE |
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| 2 DCS/TECHNICAL SERVICES | BFB | 11-4 | Final Rad-Safe Report, Operation CASTLE | | |
| CHIEF, WPNS DEV | | | | | |
| 1 CHIEF, WPNS EFFECTS | ABH | 27 Nov 54 | | | |
| 6 CHIEF, WPNS TEST | ABH | 11/15 | | | |
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| Cys 2A & 3A retained for file in EF-1. | | | | | |
| <p>③ Per your request. <i>ABH</i> file with En #11675</p> <p>c/s - should be read in conjunction with Capt Maynard's comments attached. Weather predictions were satisfactory for a 12 hour period. The unexpected feature was that fallout lasted for 18 hours. There was actually a command problem of integrating several specialties and explaining opinions. Maynard's comments on Greenhouse Item, shows the fingers from RE [redacted] ATO [redacted] 54</p> | | | | | |

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